

Installation, Start-Up and Service Instructions

SAFETY CONSIDERATIONS

Installing and servicing air conditioning equipment can be hazardous due to system pressure and electrical components. Only trained and qualified service personnel should install or service air conditioning equipment.

Untrained personnel can perform basic maintenance, such as cleaning and replacing filters. All other operations should be performed by trained service personnel. When working on air conditioning equipment, observe precautions in literature and on tags and labels attached to unit.

Follow all safety codes. Wear safety glasses and work gloves. Use quenching cloth for brazing operations. Have fire extinguisher available. Read these instructions *thoroughly*. Consult local building codes and National Electrical Code (NEC) for special installation requirements.

⚠ WARNING

Before installing or servicing system, always turn off main power to system. There may be more than one disconnect switch. Turn off accessory heater power if applicable. Electrical shock can cause personal injury.

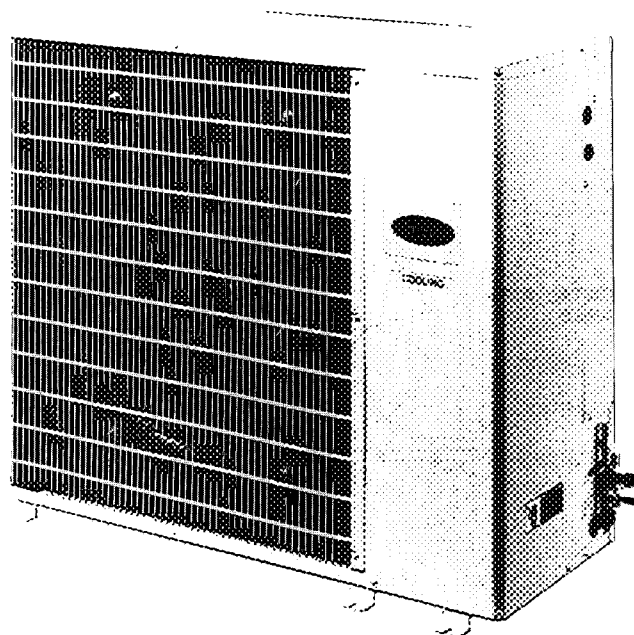


Fig. 1 — Model 38HD

INSTALLATION

Step 1 — Complete Pre-Installation Checks.

UNPACK UNIT (See Fig. 1.) — Move unit to final location. Remove carton from unit being careful not to damage service valves and grilles.

INSPECT SHIPMENT — File claim with shipping company if shipment is damaged or incomplete.

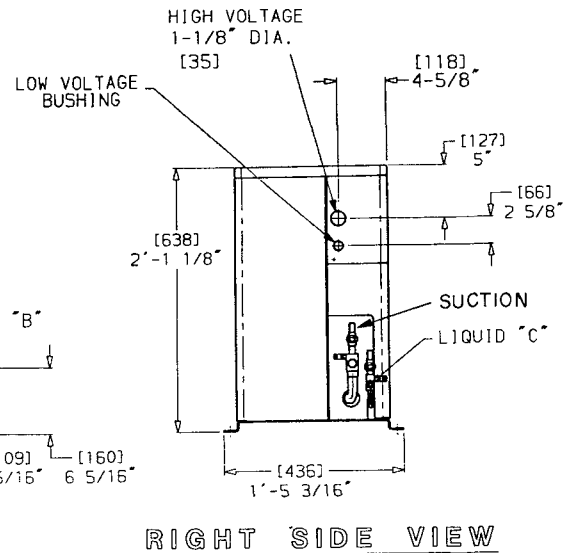
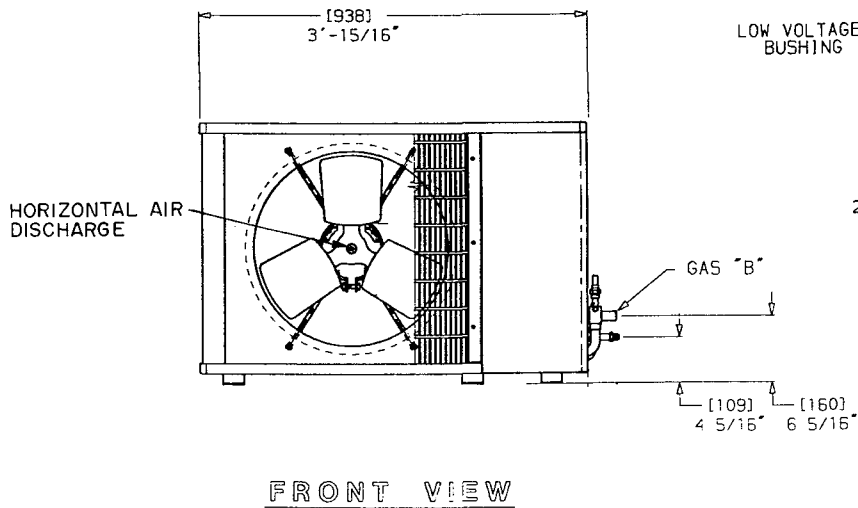
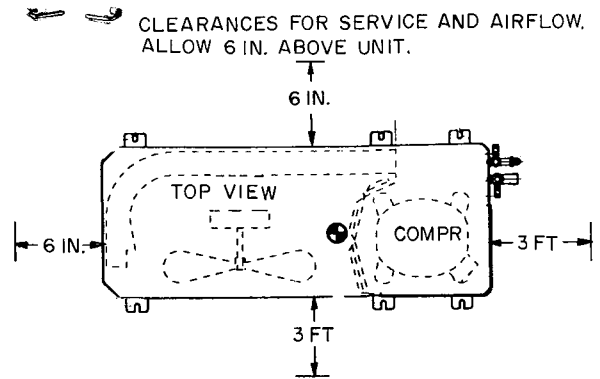
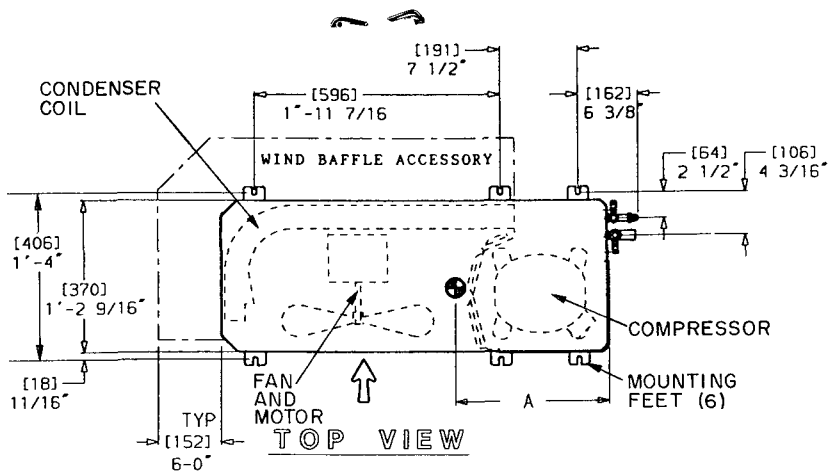
CONSIDER SYSTEM REQUIREMENTS — Consult local building codes and National Electrical Code (NEC) for special installation requirements.

Allow sufficient space for airflow clearance, wiring, refrigerant piping, and servicing unit. See Fig. 2 and 3.

Locate unit so that condenser airflow is unrestricted on both sides. Refer to Fig. 2 and 3.

Unit may be mounted on a level pad directly on base legs or mounted on raised pads at support points. See Fig. 2 and 3 for center of gravity.

CHECK ACCURATER® — The correct AccuRater (bypass type) refrigerant control is required for cooling system capacity optimization. An AccuRater with field-replaceable piston (see Fig. 4) is supplied on evaporator. Use Optimization Chart, Table 1, to find AccuRater piston size required for condenser/evaporator system being installed. Note that one of 2 types of AccuRaters can be found on the indoor unit. Determine from Fig. 4 and Table 1 which type is in the indoor unit. *Do not* interchange components between AccuRater types. Matching of condensing unit with evaporator may require field replacement of piston. Refer to Table 1. Replace piston, *if required*, before connecting refrigerant lines. Piston replacement instructions are included in evaporator installation book. After system installation is complete, see Refrigerant Charging to check and/or adjust refrigerant charge.

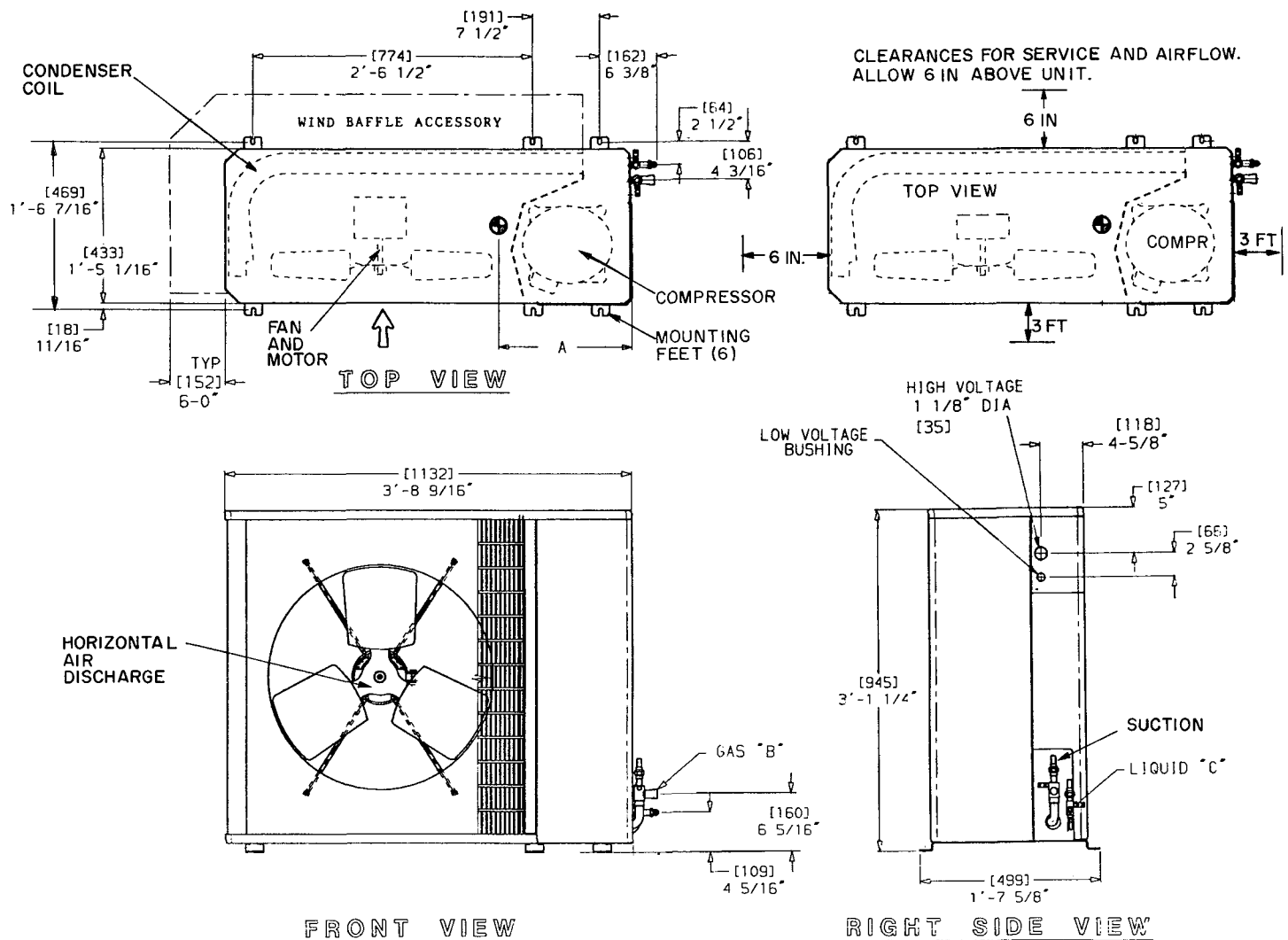


UNIT	WEIGHT	A	B	C
38HD018	(67.1 kg) 148 lbs	(329) 1'-1"	(15.88) 5/8"	(9.53) 3/8"
38HD024	(72.6 kg) 160 lbs	(329) 1'-1"	(15.88) 5/8"	(9.53) 3/8"
38HD030	(77.6 kg) 171 lbs	(329) 1'-1"	(15.88) 5/8"	(9.53) 3/8"

NOTES

- 1 Dimensions in [] are in millimeters
- 2 Air Direction →
3. Center of Gravity ●
- 4 Footprint 018-030, 3.7 sq ft (3.4 m²)

Fig. 2 — 38HD Dimensional Drawing, 018-030

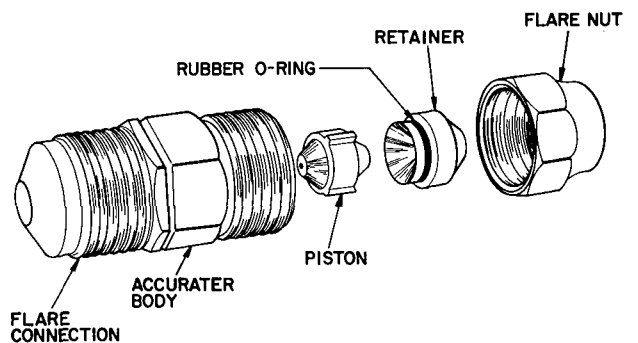


UNIT	WEIGHT	A	B	C
38HD036	(108.9 kg) 240 lbs	(352) 1'-1 7/8"	(19.05) 3/4"	(9.53) 3/8"
38HD048	(110.7 kg) 244 lbs	(347) 1'-1 5/8"	(19.05) 3/4"	(9.53) 3/8"
38HD060	(110.7 kg) 244 lbs	(368) 1'-2 1/2"	(22.22) 7/8"	(9.53) 3/8"

NOTES

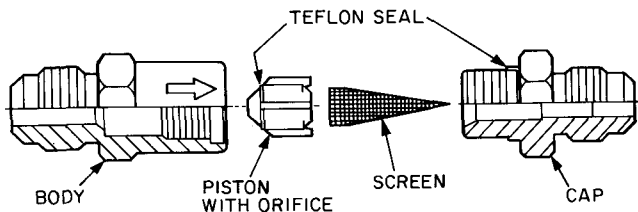
- 1 Dimensions in [] are in millimeters
- 2 Air Direction →
- 3 Center of Gravity ⊕
- 4 Footprint 036-060, 5.3 sq ft (49 m²)

Fig. 3 — 38HD Dimensional Drawing, 036-060



TYPE A

(Arrow on AccuRater body points in **metering** direction.)



TYPE B

(Arrow on AccuRater body points in **free flow** direction.)

Fig. 4 — AccuRater® (Bypass Type) Components

Step 2 — Rig and Mount Unit

MOUNTING ON GROUND — Mount on a solid, level, concrete pad. Position unit so water or ice from roof cannot drop directly onto unit. Stacking Kit 38HD900031 and -041 are available where such application is required. See instructions provided with accessory kit. If conditions or local codes require unit be fastened to pad, tiedown bolts should be used and fastened through slots provided in unit mounting feet.

MOUNTING ON ROOF — Mount on a level platform or frame.

RIGGING

⚠ CAUTION

Be sure unit panels are securely in place prior to rigging.

Keep unit upright. Lift unit using sling. Use cardboard or padding under sling, and spreader bars to prevent sling damage to unit. See Fig. 5. See Fig. 2 and 3 for center of gravity reference. Install unit so that coil does not face into prevailing winds. If this cannot be done, and constant winds above 25 mph are expected, use Accessory Wind Baffle, Part Number 38QR900041 or -051. See instructions provided with accessory kit.

Step 3 — Complete Refrigerant Piping Connections

Condensing units may be connected to evaporator sections using field-supplied tubing of refrigerant grade, correct size and condition. See Table 2. Do not use less than 10 ft of interconnecting tubing and do not bury more than 3 ft of line set underground. If any section is buried, there must be a 6-in. vertical rise to the valve connections on the outdoor unit.

Table 1 — AccuRater Optimization Chart

OUTDOOR UNIT	INDOOR UNIT	INDOOR PISTON	PISTON TYPE	REQUIRED SYSTEM CHARGE (lb)
38HD018	28RD024	—	A	—
	40HD024	—	B	—
38HD024	28RD030	61	A	5.5
	40HD024	—	B	—
38HD030	28RD043	70	A	5.7
	40HD036	—	B	—
38HD036	28RD043	73	A	11.5
	40HD036	—	B	—
38HD048	28RD049	86	A	9.7
	40HD048	—	B	—
38HD060	28RD061	88	A	11.2
	40HD060	—	B	—

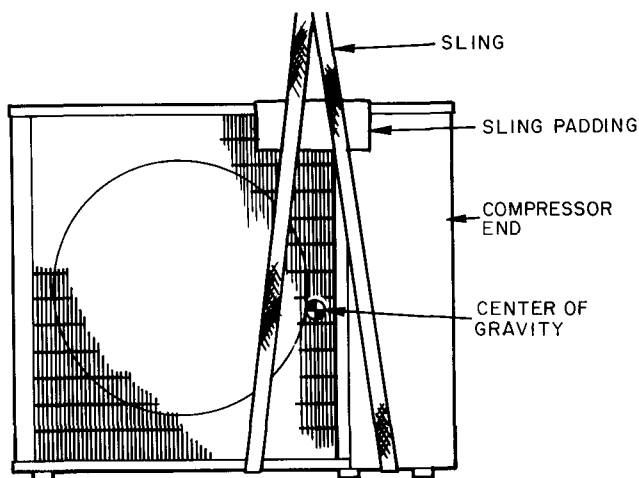


Fig. 5 — Lifting with Sling

If more than the recommended length is buried, refrigerant may migrate to cooler buried section during extended periods of unit shutdown. This causes refrigerant slugging and possibly compressor damage at start-up.

When more than 50 ft of interconnecting tubing and more than 30 ft vertical lift is used, consider the amount of liquid lift, and compressor oil return. See Part 3 of Carrier System Design Manual for design details, or contact your local Distributor.

If either refrigerant tubing or indoor coil is exposed to atmospheric conditions for longer than 5 minutes, it must be evacuated to 1000 microns to eliminate contamination and moisture in the system.

Run refrigerant tubes as directly as possible, avoiding unnecessary turns and bends. Suspend refrigerant tubes so they do not damage insulation on vapor tube and do not transmit vibration to structure. Also, when passing refrigerant tubes through wall, seal opening, so vibration is not transmitted to structure. Leave some slack in refrigerant tubes between structure and unit to absorb vibration. Refer to evaporator installation instructions for additional information.

USE FILTER DRIER AND MOISTURE INDICATOR — The filter drier is factory supplied. Moisture indicator (sight glass) is a field-supplied option and

Table 2 — Physical Data

UNIT 38HD	018	024	030	036	048	060
OPER WT (lb), 1 ph/3 ph	148/*	160/*	171/*	240/226	244/235	244/235
REFRIGERANT	R-22					
COMPRESSOR Model	Tecumseh AW5519	Tecumseh AW5524	Carlyle J30	Carlyle J36	Carlyle J48	Copeland CRP5-0450
Oil (pts), initial/recharge	32/30	32/30	40	46/44		70/66
Crankcase Heater Watts						
CONDENSER AIR FAN	Propeller, Direct Drive					
Number — Rpm			1 — 850			
Diameter (in.) — no. blades	25	18 — 3	27		24 — 3	
Fan Pitch					24	
Motor Hp (NEMA)		1/8			1/4	
Nominal Cfm	1835	1720	1750		3900	
CONDENSER COIL						
Rows	1 1/2	2		2	2	2
Face Area (sq ft)		6 1		15	12.3	
Fins/in.						
CONNECTIONS						
Suction (in.), Sweat		5/8		3/4		7/8
Liquid (in.), Flare				3/8		
LINE SIZES						
Suction		5/8		3/4		1 1/8
Liquid				3/8		
CONTROLS						
Pressurestat Settings						
High Cutout			426 ± 7			
Cut-in			320 ± 20			
Low Cutout			7 ± 5			
Cut-in			22 ± 5			
FUSIBLE PLUG			210 F			

*Not applicable

should be installed just after liquid line shutoff valve. *Do not use a receiver* (a receiver is not provided with unit and one should not be used).

MAKE PIPING SWEAT CONNECTIONS — Remove plastic caps from liquid and suction service valves. Use refrigerant grade tubing. Service valves are closed from the factory and ready for brazing. After wrapping the service valve with a wet cloth, the tubing set can be brazed to the service valve using either silver bearing or non-silver bearing brazing material. Consult local code requirements. Refrigerant tubing and indoor coil are now ready for leak testing.

NOTE: Unit is shipped with R-22 factory holding charge indicated on nameplate.

Pass nitrogen or other inert gas through piping while brazing to prevent formation of copper oxide.

⚠ CAUTION

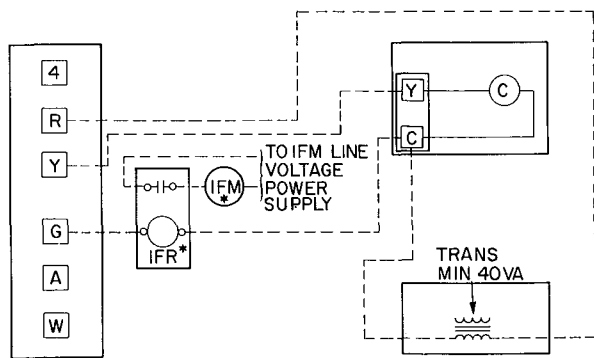
To avoid damage while brazing, service valves should be wrapped with a heat-sinking material such as a wet cloth.

PROVIDE SAFETY RELIEF — A fusible plug is located in unit suction line. Do not cap this plug. If local code requires additional safety devices, install as directed.

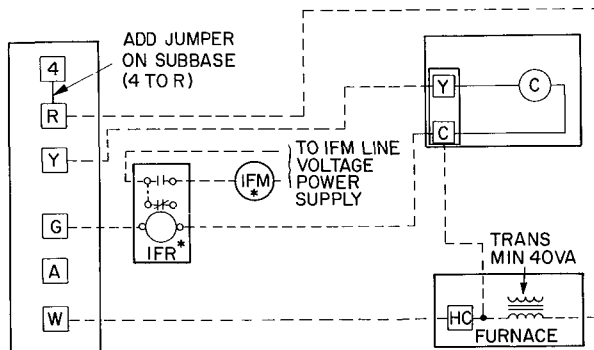
Step 4 — Complete Electrical Connections

POWER WIRING — Unit is factory wired for voltage shown on nameplate. Provide adequate fused disconnect switch within sight of unit, readily accessible, but out of reach of children. Provision for locking switch open (off) is advisable to prevent power from being turned on while unit is being serviced. Disconnect switch, fuses, and field wiring must comply with National Electrical Code and local code requirements. Use copper wire only between disconnect switch and unit. Use minimum 60 C wire for field power connection.

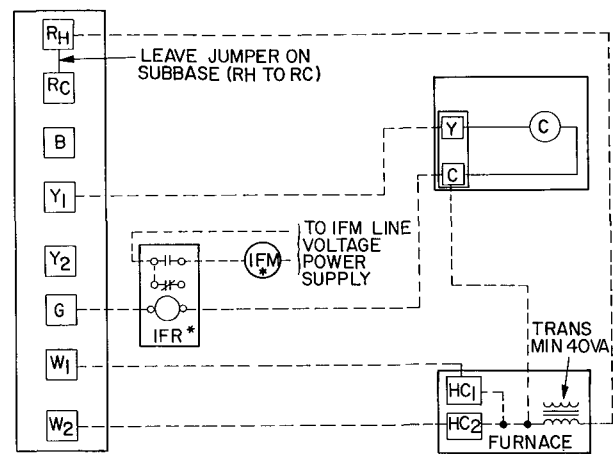
Route power wires through opening in unit side panel and connect in unit control box as shown on unit label diagram and Fig. 6. Unit must be grounded



ARRANGEMENT A-(COOLING ONLY)



ARRANGEMENT B-ONE TRANSFORMER
(COOLING AND ONE-STAGE HEATING)



ARRANGEMENT C-ONE TRANSFORMER
(COOLING AND TWO-STAGE HEATING)

*IFR and IFM are located in furnace on heating-cooling applications. If accessory IFR is required for cooling-only applications, locate (IFR) in fan coil.

C — Contactor (12-v)
HC — Heating Control
IFM — Indoor Fan Motor
IFR — Indoor Fan Relay
Trans — Transformer

----- Field Wiring
 _____ Factory Wiring

NOTE: Refer to unit wiring label for wire colors C to G and C to Y connections.

Fig. 6 — Typical Control Circuit Connections

CONTROL CIRCUIT WIRING — Control voltage is 24 volts (40 va minimum). See Fig. 6 and unit label diagram for field-supplied wiring details. Route control wires through opening in unit side panel to connection in unit control box.

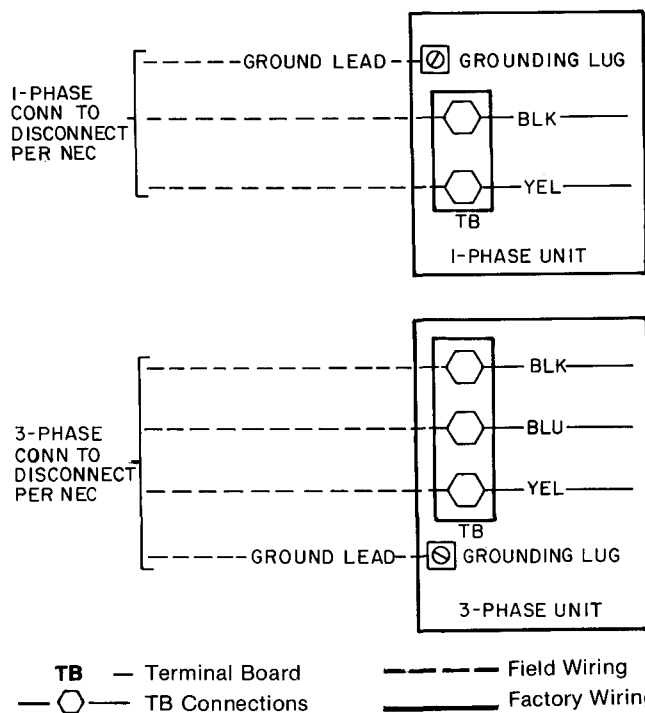


Fig. 7 — Line Power Connections

NOTE: For wire runs up to 50 ft, use no. 18 AWG insulated wire (35 C minimum). For 50 to 75 ft, use no. 16 AWG insulated wire (35 C minimum). For over 75 ft, use 14 AWG insulated wire (35 C minimum).

NOTE: Operation of unit on improper line voltage constitutes abuse and could affect Carrier warranty. See Table 3. Do not install unit in system where voltage may fluctuate above or below permissible limits.

See Table 3 for recommended fuse sizes. When making electrical connections, provide clearance at unit for refrigerant piping connections.

Use furnace or fan coil transformer as 24-v (40-v minimum) supply for system as shown in Fig. 7 or use accessory transformer.

⚠ WARNING

To avoid personal injury, be sure indoor blower has stopped before attempting service or maintenance.

Operating voltage to compressor must be within voltage range indicated on unit nameplate. On 3-phase units voltages between phases must be balanced within 2%. Use the following formula to determine the % voltage imbalance.

% Voltage Imbalance

$$= 100 \times \frac{\text{max voltage deviation from average voltage}}{\text{average voltage}}$$

Table 3 — Electrical Data (60 Hz)

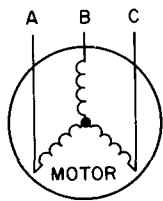
OUTDOOR UNIT 38HD	V/PH	OPER VOLTS*		COMPR		FAN FLA	MCA	MAX FUSE OR HACR TYPE CKT BKR AMPS
		Max	Min	LRA	RLA			
018	208/230-1	254	187	52.0	8.4	.70	12.0	15
024				60.0	10.6	.70	14.0	20
030				65.0	13.5	.70	18.0	30
036				82.0	16.5	1.45	22.0	35
048				127.0	25.0	1.45	33.0	50
060				135.0	30.7	1.45	40.0	60
036	208/230-3	254	187	67.5	10.0	1.45	14.0	20
048				98.5	15.4	1.45	21.0	35
060				105.0	19.6	1.45	26.0	45
036	460-3	506	414	33.8	5.0	.80	7.0	15
048				49.3	7.7	.80	11.0	15
060				55.0	10.4	.80	14.0	20

FLA — Full Load Amps
HACR — Heating, Air Conditioning, Refrigeration
LRA — Locked Rotor Amps
MCA — Minimum Circuit Amps per NEC Section 430-24
RLA — Rated Load Amps (compressor)

*Permissible limits of the voltage range at which unit will operate satisfactorily

NOTE: Control circuit is 24v on all units and requires external power source

Example: Supply voltage is 460-3-60.



AB = 452 volts
 BC = 464 volts
 AC = 455 volts

$$\text{Average Voltage} = \frac{452 + 464 + 455}{3} = \frac{1371}{3} = 457$$

Determine maximum deviation from average voltage

(AB) 457 - 452 = 5 volts
 (BC) 464 - 457 = 7 volts
 (AC) 457 - 455 = 2 volts

Maximum deviation is 7 volts.

Determine % voltage imbalance:

$$\% \text{ Voltage Imbalance} = 100 \times \frac{7}{457} = 1.53\%$$

This amount of phase imbalance is satisfactory as it is below the maximum allowable 2%.

IMPORTANT: If the supply voltage phase imbalance is more than 2% contact your local electric utility company immediately.

Unit failure as a result of operation on improper line voltage or excessive phase imbalance constitutes abuse and may cause damage to electrical components. Such operation would invalidate any applicable Carrier warranty.

START-UP

Preliminary Checks

1. Check that all internal wiring connections are tight and that all barriers, covers and panels are in place.
2. Field electrical power source must agree with unit nameplate rating
3. All service valves must be open.
4. Crankcase heater must be tight on compressor crankcase.

Leak Test field piping and fan coil by pressure method described in Carrier Standard Service Techniques Manual, Chapter 1, Section 1-6. Use R-22 at approximately 25 psig backed up with an inert gas to a total pressure not to exceed 245 psig.

Before starting unit, crankcase heater must be on for 24 hours to be sure all refrigerant is out of the oil. To energize crankcase heater, proceed as follows: set space thermostat above ambient so there will be no demand for cooling. Close field disconnect. The crankcase heater is now energized.

Evacuate and Dehydrate field piping and fan coil by either of the methods described in Carrier Standard Service Techniques Manual, Chapter 1, Section 1-7.

⚠ CAUTION

Service valves must be fully backseated to close service port. There is no Schrader valve at the service port and failure to backseat the valve could result in loss of system charge or personal injury.

Charge System — Release holding charge into system by opening (backseating) liquid and suction line service valves. Add charge amount as required for the total system. See Table 1. For indoor sections not included in Table 1, see Refrigerant Charging.

To Start Unit — Assuring that crankcase heater has been on for 24 hours, and field disconnect is closed, set room thermostat below ambient. Unit compressor starts after a 5-minute delay if equipped with optional Time Guard® II. Operate unit for 15 minutes, then check system refrigerant charge. See Refrigerant Charging.

SERVICE

⚠ CAUTION

Before performing recommended maintenance, be sure unit main power switch is turned off. Failure to do so may result in electric shock or injury from rotating fan blade.

Condenser Fan is held by a reinforced wire mount which clamps the fan motor in position. See Fig. 8 for proper mounted fan position.

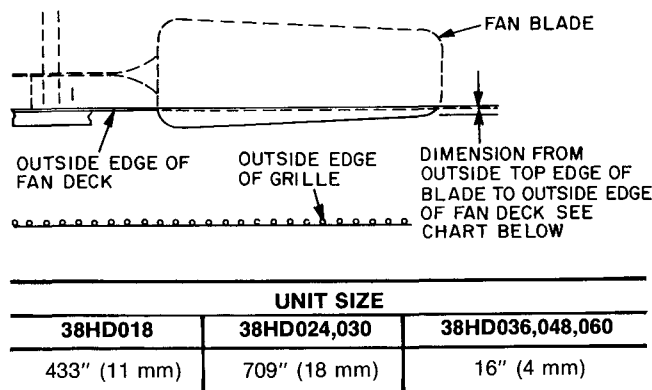


Fig. 8 — Mounted Fan Positions

High Pressure Relief Valve is located in compressor. Relief valve opens at a pressure differential of approximately 450 ± 50 psig between suction (low side) and discharge (high side) to allow pressure equalization.

Internal Current and Temperature Sensitive Overload resets automatically when internal compressor motor temperature drops to a safe level (overloads may require up to 45 minutes to reset). When an internal overload is suspected of being open, check by using an ohmmeter or continuity tester. If necessary, refer to Carrier Standard System Techniques Manual, Chapter 2, for complete information.

Pumpdown Procedure — The system may be pumped down in order to make repairs on low side without losing complete refrigerant charge.

1. Attach pressure gage to suction service valve gage port.
2. Frontseat the liquid line valve.
3. Start unit and run until suction pressure reaches 5 psig (see Caution).
4. Shut unit off and frontseat suction valve.
5. Vent remaining pressure.

⚠ CAUTION

38HD unit coils hold only the factory designated amount of refrigerant. Additional refrigerant may cause units to relieve pressure through internal pressure relief valve (indicated by a sudden rise of suction pressure) before suction pressure reaches 5 psig. If this occurs, shut off unit immediately, frontseat suction valve and vent remaining pressure.

Filter Drier — Whenever the moisture-liquid indicator shows presence of moisture, replace filter drier. Refer to Carrier Standard Service Techniques Manual, Chapter 1, Refrigerants, for details on servicing filter driers.

High-Pressure Switch — This switch, located on discharge line, protects against high discharge pressures caused by such events as overcharge, condenser fan motor failure, system restriction, etc. It opens on pressure rise at about 426 psi. If system pressures go above this setting during abnormal conditions, switch opens. *Do not* attempt to simulate these system abnormalities, as high pressures pose a serious safety hazard. High-pressure switch is also checked with an ohmmeter similar to checking low-pressure switch. If system pressure is below 426 psi, switch shows continuity. It is replaced in same manner as low-pressure switch. Observe all safety precautions.

Low-Pressure Switch — This switch, mounted on the suction line, has fixed nonadjustable settings.

TO CHECK — Attach pressure gage to suction service valve gage port. Slowly close liquid shutoff valve and allow compressor to pump down. Do not allow compressor to pump down below 2 psig (13.8 kPa). Compressor should shut down when suction pressure drops to cutout pressure in Table 2, and should restart when pressure builds up to cut-in pressure shown after CLO (Compressor Lockout) has been reset and optional Time Guard has completed its timing cycle.

Crankcase Heater prevents refrigerant migration and compressor oil dilution during shutdown when compressor is not operating. If crankcase heater is de-energized for more than 6 hours, both compressor service valves must be closed.

Crankcase heaters come in 2 basic types: wraparound (bellyband) type that is wrapped externally around compressor shell, and insertion type that is inserted into compressor oil well in shell of compressor. Both types are in this family of units.

Crankcase heater is powered by *high-voltage* power of unit. It is connected across the line side of the contactor and operates continually. Use extreme caution troubleshooting this device with power on. Easiest method of troubleshooting is to apply voltmeter across crankcase heater leads to see if heater voltage is on. Do not touch heater. Carefully feel area around crankcase heater. If warm, crankcase heater is probably functioning. With power off, and heater leads disconnected, check across leads with ohmmeter. Do not look for a specific resistance reading. Check for resistance or an open circuit. Change heater if an open circuit is detected.

Service Valves — The service valves in the condensing unit come from the factory frontseated. This means the refrigerant charge is isolated from the line set connection ports. To prevent damage to the valve, use a wet cloth or other accepted heat sink material on the valve before brazing.

The service valves must be backseated (turned counter-clockwise until seated) before the service port caps can be removed and hoses of gage manifold connected. In this position, refrigerant has access from and through outdoor and indoor unit. The service valve cannot be

field repaired, therefore only a complete valve or valve stem and service port caps are available for replacement.

AccuRater® (Bypass Type) Servicing — See Fig. 4 for bypass type AccuRater components. The piston has a refrigerant metering hole through it. The retainer forms a stop for the piston in the refrigerant bypass mode, and a sealing surface for liquid line flare connection. To check, clean or replace piston:

1. Shut off power to unit.
2. Pump unit down using Pumpdown Procedure described previously.
3. Remove liquid line flare connection from AccuRater.
4. Pull retainer out of body, being careful not to scratch flare sealing surface. If retainer does not pull out easily, carefully use locking pliers to remove retainer.
5. Slide piston out by inserting a small soft wire, with small kinks, through metering hole. Ensure metering hole, sealing surface around piston cones and fluted portion of piston are not damaged.
6. Clean piston refrigerant metering hole.
7. Replace retainer O-ring before reassembling bypass type AccuRater. Carrier O-ring part number is 99CC501052.

Refrigerant Charging

⚠ CAUTION

To prevent personal injury, wear safety glasses and gloves when handling refrigerant. Do not overcharge system. This can cause compressor flooding.

⚠ CAUTION

Service valves must be fully backseated to close service port. There is no Schrader valve at the service port and failure to backseat the valve could result in loss of system charge or personal injury.

To check and adjust charge during cooling season, use Tables 4 and 5 and the following procedure:

1. Operate unit a minimum of 15 minutes before checking charge.
2. Measure suction pressure by attaching a gage to suction valve service port.
3. Measure suction line temperature by attaching a service thermometer to unit suction line near suction valve. Insulate thermometer for accurate readings.
4. Measure outdoor coil inlet air dry-bulb temperature with a second thermometer.
5. Measure indoor coil inlet air wet-bulb temperature with a sling psychrometer.
6. Refer to Table 4. Find air temperature entering outdoor coil and wet-bulb temperature entering indoor coil. At this intersection note the superheat.
7. Refer to Table 5. Find superheat temperature and suction pressure, note suction line temperature.
8. If unit has higher suction line temperature than charted temperature, add refrigerant until charted temperature is reached.
9. If unit has lower suction line temperature than charted temperature, bleed refrigerant until charted temperature is reached.
10. If air temperature entering outdoor coil or pressure at suction valve changes, charge to new suction line temperature indicated on chart.
11. This procedure is valid, independent of indoor air quantity.

**Table 4 — Superheat Charging Table
(Superheat Entering Suction Service Valve)**

OUTDOOR TEMP (F)	INDOOR COIL ENTERING AIR (F) WB															
	50	52	54	56	58	60	62	64	66	68	70	72	74	76		
55	9	12	14	17	20	23	26	29	32	35	37	40	42	45		
60	7	10	12	15	18	21	24	27	30	33	35	38	40	43		
65	—	6	10	13	16	19	21	24	27	30	33	36	38	41		
70	—	—	7	10	13	16	19	21	24	27	30	33	36	39		
75	—	—	—	6	9	12	15	18	21	24	28	31	34	37		
80	—	—	—	—	5	8	12	15	18	21	25	28	31	35		
85	—	—	—	—	—	—	8	11	15	19	22	26	30	33		
90	—	—	—	—	—	—	5	9	13	16	20	24	27	31		
95	—	—	—	—	—	—	—	6	10	14	18	22	25	29		
100	—	—	—	—	—	—	—	—	8	12	15	20	23	27		
105	—	—	—	—	—	—	—	—	5	9	13	17	22	26		
110	—	—	—	—	—	—	—	—	—	6	11	15	20	25		
115	—	—	—	—	—	—	—	—	—	—	8	14	18	23		

— Do not attempt to charge system under these conditions or refrigerant slugging may occur

**Table 5 — Required Suction-Tube Temperature (F)
(Entering Suction Service Valve)**

SUPERHEAT TEMP (F)	SUCTION PRESSURE AT SERVICE PORT (psig)								
	61.5	64.2	67.1	70.0	73.0	76.0	79.2	82.4	85.7
0	35	37	39	41	43	45	47	49	51
2	37	39	41	43	45	47	49	51	53
4	39	41	43	45	47	49	51	53	55
6	41	43	45	47	49	51	53	55	57
8	43	45	47	49	51	53	55	57	59
10	45	47	49	51	53	55	57	59	61
12	47	49	51	53	55	57	59	61	63
14	49	51	53	55	57	59	61	63	65
16	51	53	55	57	59	61	63	65	67
18	53	55	57	59	61	63	65	67	69
20	55	57	59	61	63	65	67	69	71
22	57	59	61	63	65	67	69	71	73
24	59	61	63	65	67	69	71	73	75
26	61	63	65	67	69	71	73	75	77
28	63	65	67	69	71	73	75	77	79
30	65	67	69	71	73	75	77	79	81
32	67	69	71	73	75	77	79	81	83
34	69	71	73	75	77	79	81	83	85
36	71	73	75	77	79	81	83	85	87
38	73	75	77	79	81	83	85	87	89
40	75	77	79	81	83	85	87	89	91

Time Guard® II Device — Accessory Time Guard II device is shipped in 6-pack units. Apply it to Carrier 38HD units to protect the unit compressor from short cycling. See Fig. 9. The device prevents short cycling by providing a 5-minute delay (± 2 minutes) before restarting a compressor after shutdown for any reason. On normal start-up, the 5-minute delay occurs before the thermostat closes. After the thermostat closes, the Time Guard II device then has a 3-second delay prior to contactor closure.

INSTALLATION — Install the Time Guard II device in the 24-v control circuit, locating it in the space provided at the front of the control box, using the screws provided.

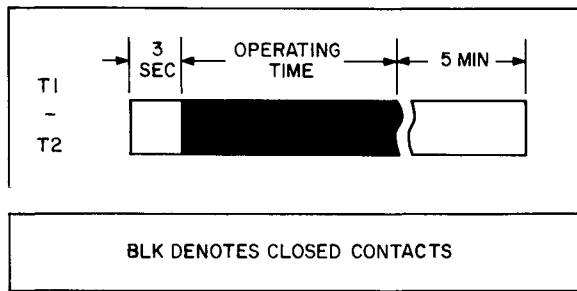


Fig. 9 — Time Guard II Sequence Chart

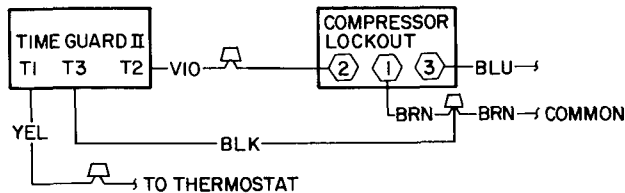


Fig. 10 — Wiring Diagram

See Fig. 10. Wire the device in series between the compressor lockout (CLO) and the unit thermostat as shown on unit wiring diagram.

Remove the wire from terminal 2 on the compressor lockout and connect the violet wire from T2 on the Time Guard II device to terminal 2 on the compressor lockout. Connect the wire removed from terminal 2 on the compressor lockout to yellow wire T1 on the Time Guard II device. Connect black wire T3 on Time Guard II device to common.

Compressor Lockout — Units with compressor lockout protective device shut down on any safety trip. Determine reason for safety trip. To restart, turn the thermostat to OFF and then to COOL.

MAINTENANCE

⚠ CAUTION

Before performing recommended maintenance, be sure unit main power switch is turned off. Failure to do so may result in electric shock or injury from rotating fan blade.

Lubrication

COMPRESSOR contains factory oil charge. Replace oil when lost. See Table 2 for oil recharge and refer to Carrier Standard Service Techniques Manual, Chapter 1, page 1-21, for oil recharging procedure. Use Carrier PP33-1, Texaco WF-32 or Suniso 3GS oil.

FAN MOTOR BEARINGS — Oiling holes are provided at each end of condenser fan motor. Remove fan motor and lubricate motor with 32 drops (16 drops per hole) of SAE-10 nondetergent oil at intervals described below:

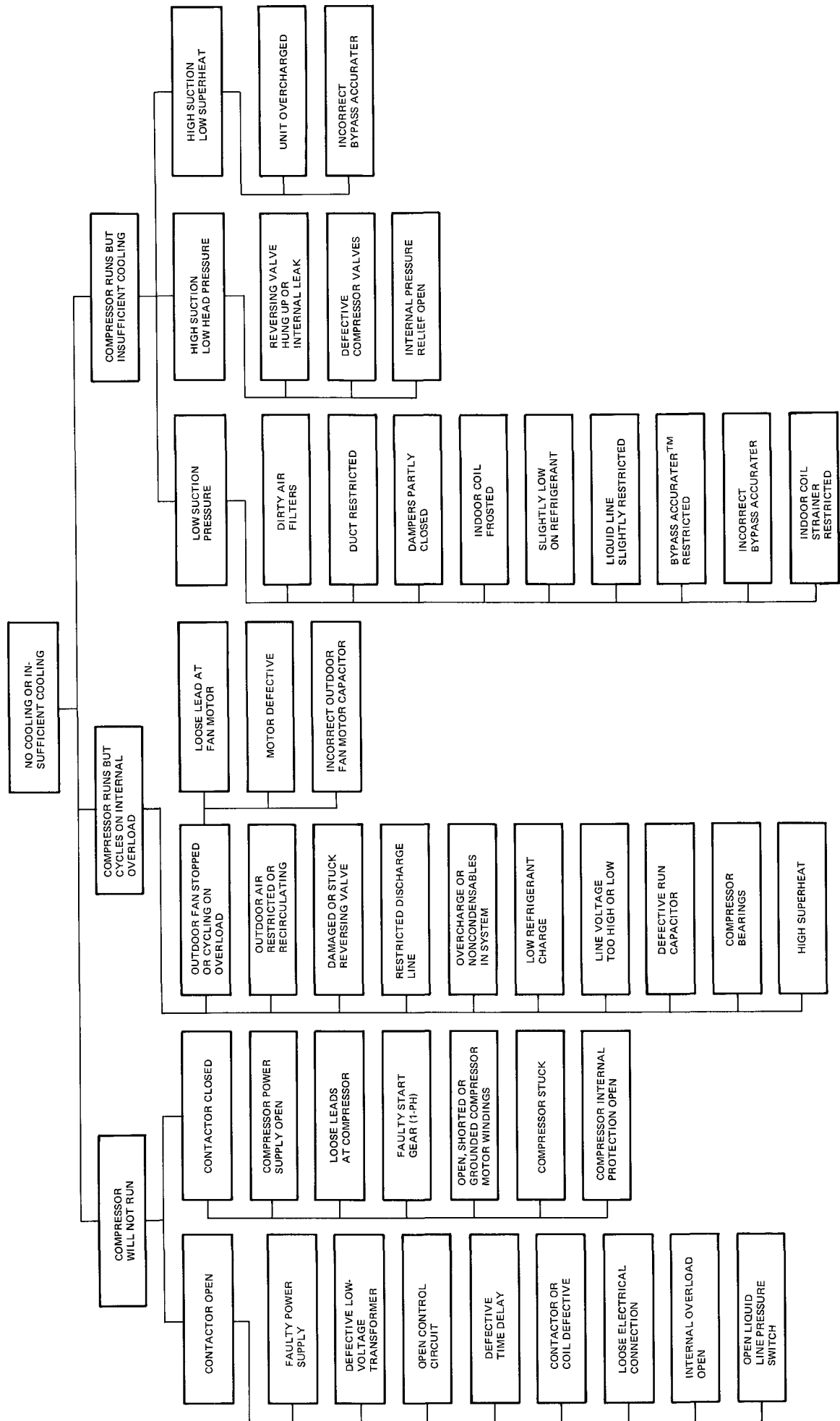
- Annually, when environment is very dirty, ambient temperature is higher than 105 F and average unit operating time exceeds 15 hours a day
- Every 3 years when environment is reasonably clean, ambient temperature is less than 105 F and unit operating time averages 8 to 15 hours a day.
- Every 5 years when environment is clean, ambient temperature is less than 105 F and unit operating time averages less than 8 hours a day.

Cleaning Coils — Coils should be washed out with water, or blown out with compressed air. The blow-thru design causes dirt and debris to build up on the inside of the coils.

Clean coil annually or as required by location or outdoor air conditions. Inspect coil monthly, and clean as required. Fins are not continuous through coil sections. Dirt and debris may pass through first section, become trapped between the row of fins and restrict condenser airflow. Use a flashlight to determine if dirt or debris has collected between coil sections. Clean coil as follows:

- Turn off unit power.
- Using a water hose, or other suitable equipment, flush coil from the outside to remove dirt. Be sure to flush all dirt and debris from drain holes in base of unit. Fan motors are waterproof.

TROUBLESHOOTING CHART — COOLING CYCLE



Manufacturer reserves the right to discontinue, or change at any time, specifications or designs without notice and without incurring obligations.

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Tab 3a 2a

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Replaces: New

For replacement items use Carrier Specified Parts